



Dear Customer

Please find attached the July 2014 amendment to C/AS7 Acceptable Solution for Buildings Used for Vehicle Storage and Parking (Risk Group VP), published by the Ministry of Business, Innovation and Employment. The Ministry of Business, Innovation and Employment combines the former Department of Building and Housing, Department of Labour, Ministry of Economic Development and Ministry of Science and Innovation.

To update your printed copy of C/AS7, please make the following changes:

Section	Previous version	July 2014 amendment
C/AS7 Acceptable Solution for Buildings Used for Vehicle Storage and Parking (Risk Group VP)		
Title pages	Remove document history/status	Replace with new title page and document history/status
Definitions	Remove pages 9/10	Replace with new pages 9/10
C/AS7 Part 1	Remove pages 13/14	Replace with new pages 13/14
C/AS7 Part 2	Remove pages 15/16	Replace with new pages 15/16
C/AS7 Parts 3 and 4	Remove pages 17/18	Replace with new pages 17/18



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HĪKINA WHAKATUTUKI

C/AS7

**Acceptable Solution for Buildings
Used for Vehicle Storage and Parking
(Risk Group VP)**

For New Zealand Building Code Clauses
C1-C6 Protection from Fire



Using this Acceptable Solution

The Ministry of Business, Innovation and Employment may amend parts of this Acceptable Solution at any time. People using this Acceptable Solution should check on a regular basis whether new versions have been published. The current version can be downloaded from www.dbh.govt.nz/compliance-documents

Users should make themselves familiar with the preface to the New Zealand Building Code Handbook, which describes the status of Acceptable Solutions and explains other ways of achieving compliance.

Defined words (italicised in the text) are explained in the Building Code Clause A2 and in the Definitions section of this Acceptable Solution. Classified uses of buildings are explained in the Building Code Clause A1.

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Status of C/AS7

This Acceptable Solution C/AS7, for buildings used for vehicle storage and parking (Risk Group VP), provides a means of compliance with the New Zealand Building Code Clauses C1-C6 Protection from Fire. It is issued under section 22 of the Building Act 2004 as an Acceptable Solution.

This Acceptable Solution is one way that can be used to show compliance with the New Zealand Building Code Clauses C1-C6 Protection from Fire. Other ways of complying with the Building Code are described, in general terms, in the preface of the New Zealand Building Code Handbook.

When can you use C/AS7

This Acceptable Solution is effective from 1 July 2014. It can be used to show compliance with the Building Code Clauses C1-C6 Protection from Fire. It does not apply to building consent applications submitted before 1 July 2014.

The previous version, Amendment 2, of this Acceptable Solution can be used to show compliance with the Building Code Clauses C1-C6 Protection from Fire until 28 February 2015. It can be used for building consent applications submitted before 1 March 2015.

Document History			
	Date	Alterations	
New document	Effective from 10 April 2012	C/AS7 is a new publication that can be used to show compliance with the Building Code Clauses C1-C6 Protection from Fire.	
Amendment 1 (Errata 1)	Effective from 15 February 2013 until 18 June 2014	p. 11 Definitions p. 19 4.1.2 p. 20 5.6.2	
Amendment 2	Effective from 19 December 2013 until 28 February 2015	p. 7 References p. 14 1.1.1, 1.1.2, Table 1.1	p. 15 2.2.1, 2.2.3
Amendment 3	Effective from 1 July 2014	p. 9 Definitions p. 14 1.2, Table 1.1 p. 15 2.2.1	p. 17 3.4.1, Table 3.2 p. 18 4.1.1

Definitions

The full list of definitions for italicised words may be found in the New Zealand Building Code Handbook.

Building has the meaning given to it by sections 8 and 9 of the Building Act 2004.

Comment:

Notwithstanding the definition of *building*, a number of separated *buildings* cannot be taken as a single *firecell* for the purposes of this Acceptable Solution.

Building Act 2004 (the Building Act)

means the principal legislation dealing with building controls in New Zealand.

Comment:

The *Building Act* applies to the construction, alteration, and demolition of new and existing buildings throughout New Zealand.

Building Code means the regulations made under section 400 of the *Building Act 2004*

Construct in relation to a *building*, includes to design, build, erect, prefabricate, and relocate the *building*; and construction has a corresponding meaning.

Dead end That part of an open path where escape is possible in only one direction.

Comment:

A *dead end* ceases to exist where the *escape route* reaches a point in the *open path* which offers alternative directions of travel, or at a *final exit* or an *exitway*.

Early childhood centre (ECC) means premises used regularly for the education or care of 3 or more children (not being children of the persons providing the education or care, or children enrolled at a school being provided with education or care before or after school) under the age of six—

- a) by the day or part of a day; but
- b) not for any continuous period of more than seven days.

ECC does not include home based early childhood services.

Escape route A continuous unobstructed route from any *occupied space* in a *building* to a *final exit* to enable occupants to reach a *safe place*, and shall comprise one or more of the following: *open paths* and *safe paths*.

Comment:

Doors are not obstructions in an escape route provided they comply with C/AS1–C/AS7 and D1/AS1.

External wall Any exterior face of a *building* within 30° of vertical, consisting of *primary* and/or *secondary elements* intended to provide protection against the outdoor environment, but which may also contain *unprotected areas*.

Comment:

A roof is an *external wall* if within 30° of the vertical.

Final exit The point at which an *escape route* terminates by giving direct access to a *safe place*.

Comment:

Final exits are commonly the external doors from a ground floor, but this applies only if such doors open directly onto a *safe place*. If a *safe place* can be reached only by passing down an alley, or across a bridge, then the *final exit* is not reached until the end of such an alley or bridge. *Final exits*, therefore, should be seen strictly as a point of arrival, rather than as any particular element of a *building*. They are determined entirely by the definition of *safe place*.

Fire The state of combustion during which flammable materials burn producing heat, toxic gases, or smoke or flame or any combination of these.

Firecell Any space including a group of contiguous spaces on the same or different levels within a *building*, which is enclosed by any combination of *fire separations*, *external walls*, roofs, and floors.

Comment:

Floors, in this context, includes ground floors, and those in which the underside is exposed to the external environment (eg, when cantilevered). Note also that internal floors between *firecells* are *fire separations*.

Fire resistance rating (FRR) The term used to describe the minimum *fire* resistance required of *primary* and *secondary elements* as determined in the *standard test* for *fire* resistance, or in accordance with a specific calculation method verified by experimental data from standard *fire* resistance tests. It comprises three numbers giving the time in minutes for which each of the criteria *structural adequacy*, *integrity* and *insulation* are satisfied, and is presented always in that order.

Comment:

Examples of FRRs are:

- a) 60/60/30 indicating *structural adequacy* 60 minutes, *integrity* 60 minutes, *insulation* 30 minutes.
- b) 30/-/- indicating *structural adequacy* 30 minutes, but no time requirement for *integrity* or *insulation*.
- c) 60/30/x indicating *structural adequacy* of 60 minutes, *integrity* of 30 minutes, and a requirement for *insulation*.

Fire safety systems means the combination of all active and passive protection methods used in a *building* to—

- (a) warn people of an emergency; and
- (b) provide for safe evacuation; and
- (c) provide for access by, and the safety of, firefighters; and
- (d) restrict the spread of *fire*; and
- (e) limit the impact of *fire* on structural stability

Fire separation Any *building element* which separates *firecells* or *firecells* and *safe paths*, and provides a specific *fire resistance rating*.

Foamed plastics *Combustible* foamed plastic polymeric materials of low density (typically less than 100 kg/m³) and are classified as cellular polymers which are manufactured by creating a multitude of fine void (typically 90 to 98%) distributed more or less uniformly throughout the product. Examples of *foamed plastics* are latex foams, polyethylene foams, polyvinyl chloride foams, expanded or extruded polystyrene foams, phenolic foams, ureaformaldehyde foams, polyurethane foams and polychloropene foams.

Comment:

1. *Foamed plastics* may be rigid or flexible, but rigid foams are the most common in *building* products. When burnt they tend to generate high levels of heat energy (kJ/kg) and varying quantities of smoke and other toxic gases depending on the nature and volume of the particular product.
2. Where doubt exists as to whether a *building* material is *foamed plastics*, an opinion should be sought from a *person* or organisation with appropriate skill and experience in *fire* engineering. That opinion should be included with the *building consent* application to the *building consent authority*.

Insulation In the context of *fire* protection, the time in minutes for which a prototype specimen of a *fire separation*, when subjected to the *standard test* for *fire* resistance, has limited the transmission of heat through the specimen.

Integrity In the context of *fire* protection, the time in minutes for which a prototype specimen of a *fire separation*, when subjected to the *standard test* for *fire* resistance, has prevented the passage of flame or hot gases.

Comment:

The precise meaning of *integrity* depends on the type of *building elements* being treated and how it is defined in the *standard test* being used.

Part 1: General

CONTENTS

- 1.1 Introduction and scope
- 1.2 Using this Acceptable Solution

1.1 Introduction and scope

This Acceptable Solution can be used for establishing compliance with NZBC C1 to C6 Protection from Fire. It is one of a suite of Acceptable Solutions C/AS1 to C/AS7, each of them corresponding to a *risk group* (summarised in Table 1.1 and defined in Paragraph 1.1.1).

If the uses of a *building*, or part of a *building*, cover more than one *risk group*, one or more of these Acceptable Solutions may need to be followed to demonstrate compliance. Notes shown under 'Comment:', occurring throughout this document, are for guidance purposes only and do not form part of this Acceptable Solution. Words in *italic* are defined at the front of this document. For ease of use, paragraphs, tables and figures containing similar information are allocated the same reference numbers in each of the Acceptable Solutions.

Comment:

It is recommended that the commentary document for Acceptable Solutions C/AS1 to C/AS7 be read in conjunction with this Acceptable Solution.

Table 1.1 Risk groups and Acceptable Solutions			
	Acceptable Solution	Risk group	Applies to
C/AS1	Buildings with sleeping (residential) and outbuildings	SH	Houses, townhouses and small <i>multi-unit dwellings</i> Outbuildings
C/AS2	Sleeping (non institutional)	SM	Permanent accommodation eg, apartments Transient accommodation eg, hotels, motels, hostels, backpackers, refuge shelters Education accommodation
C/AS3	Care or detention	SI	Institutions, hospitals (excluding special care facilities), residential care, rest homes, care in the community houses and homes, medical day treatment (using sedation), detention facilities (excluding prisons)
C/AS4	Public access and educational facilities	CA	Crowds, halls, recreation centres, public libraries (<2.4 m storage height), cinemas, shops, personal services (eg, dentists and doctors except as included above, beautician and hairdressing salons), schools, restaurants and cafes, <i>early childhood centres</i>
C/AS5	Business, commercial and low level storage	WB	Offices (including professional services such as law and accountancy practices), laboratories, workshops, manufacturing (excluding <i>foamed plastics</i>), factories, processing, temperature controlled storage (capable of <3.0 m storage height other than some limited areas in processing areas) and other storage <i>buildings</i> capable of <5.0 m storage height (except some limited areas <8.0 m to the apex), light aircraft hangars
C/AS6	High level storage and other high risks	WS	Warehouses (capable of ≥5.0 m storage height other than some limited areas, see C/AS5), temperature controlled storage (capable of ≥3.0 m storage height other than some limited areas, see C/AS5), trading and bulk retail (≥3.0 m storage height)
C/AS7	Vehicle storage and parking	VP	Vehicle parking – within a <i>building</i> or a separate <i>building</i>

Amends 2 and 3

Amend 3 Jul 2014

Amend 3 Jul 2014

Amend 3 Jul 2014

Scope

1.1.1 The scope of this Acceptable Solution is restricted to *risk group* VP. This includes:

- a) Car parking *buildings*
- b) Vehicle parking or stacking within *buildings*
- c) Goods vehicle parking
- d) Service vehicle and unloading areas (where required by Acceptable Solutions C/AS2 to C/AS6)

- f) Car storage warehouses, and

Comment:

Vehicles include, but are not limited to, cars, trucks and boats.

1.1.2 Specific exclusions from the scope are:

- a) Car showrooms

- b) Mechanical workshops, and
- c) Single level boat sheds.

1.2 Using this Acceptable Solution

The requirements for *risk group* VP are the same as those for *risk group* WB, which are contained in Acceptable Solution C/AS5, with the following additions/exceptions:

- a) If the following paragraphs have the same numbering as those in Acceptable Solution C/AS5, the requirements in this Acceptable Solution for those areas of the *building* that are *risk group* VP shall replace those in C/AS5, and
- b) If the following paragraphs have different numbering to those in Acceptable Solution C/AS5, the requirements are unique to this Acceptable Solution and shall apply in addition to those in C/AS5.

Amend 2 Dec 2013

Amend 3 Jul 2014

Amend 2 Dec 2013

Amend 2 Dec 2013

Amend 2 Dec 2013



Part 2: Firecells, fire safety systems and fire resistance ratings

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- 2.2 Fire safety systems
- 2.3 Fire resistance ratings

2.2 Fire safety systems

2.2.1 The *fire safety systems* for *firecells* required for this *risk group* shall be as follows. *Fire safety system* types shall be as defined in Table 2.1. If automatic heat or smoke detection systems are provided in addition to the requirements of this paragraph, a direct connection to the Fire Service is not required.

Amend 3
Jul 2014

For ≤10 m escape height:

- a) Type 2 alarm system that need not be connected to the Fire Service (not required if there are less than 50 occupants and less than 10 vehicles), and
- b) Type 18 *building fire* hydrant system, unless the Fire Service hose run distance from Fire Service vehicular access to any point on any floor is less than 75 m.

Amend 2
Dec 2013

For >10 m escape height:

- a) Type 3 alarm system that need not be connected to the Fire Service, and
- b) Type 18 *building fire* hydrant system in all cases where the height from the Fire Service attendance point to any floor is greater than 15.0 m. Otherwise, a Type 18 system is required unless the Fire Service hose run distance from Fire Service vehicular access to any point on any floor is less than 75 m.

Amend 3
Jul 2014

Storage or parking using a vehicle stacking system

- a) Type 6 system, and
- b) Type 18 *building fire* hydrant system in all cases where the height from the Fire Service attendance point to any floor is greater than 15.0 m. Otherwise, a Type 18 system is required unless the Fire Service hose run distance from Fire Service vehicular access to any point on any floor is less than 75 m.

Amend 3
Jul 2014

If a *risk group* VP is within a *building* that is protected with an automatic *fire* alarm system, the *risk group* VP must have at the minimum a Type 3 automatic heat detection system.

2.2.3 If the *risk group* VP is required by this Acceptable Solution to be protected with a *fire* sprinkler system and the *risk group* VP is separated from the rest of the *building* by the greater of the two property ratings, the sprinkler system need not be extended throughout the *building*.

Table 2.1 Fire safety systems specified in this Acceptable Solution		
Type of system	System description	Relevant Standards for installation
2	Alarm system with manual call points	NZS 4512
3	Heat detection system with manual call points	NZS 4512
6	Automatic <i>fire</i> sprinkler system	NZS 4541
18	<i>Building fire</i> hydrant system	NZS 4510

2.3 Fire resistance ratings

FRR values

2.3.1 Unless explicitly stated otherwise in this Acceptable Solution, the *fire resistance ratings* (*FRRs*) that apply for this *risk group* shall be as follows:

Life rating = 60 minutes – applies to *fire* rating requirements in Part 3: Means of escape and Part 4: Control of internal fire and smoke spread.

Property rating = 60 minutes – applies to *fire* rating requirements in Part 5: Control of external fire spread.

2.3.2 If a *fire* sprinkler system or cross ventilation in accordance with Paragraph 4.1.2 is provided, the *FRRs* shall be:

Life rating = 30 minutes

Property rating = 30 minutes.

2.3.3 If there is more than one *risk group* on one floor in the *building*, the highest required *FRR* shall be applied to common spaces and shared *escape routes* for that floor level.

Part 3: Means of escape

CONTENTS
3.4 Length of escape routes

3.4 Length of escape routes

3.4.1 An *escape route* may be any length, but:

- a) The lengths of *dead ends* and total *open paths* shall not exceed the distances given in Table 3.2, adjusted as necessary for:
 - i) reductions on *intermediate floors* (see Paragraph 3.4.3 of Acceptable Solution C/AS5), except that car parking *buildings* with adequate cross ventilation in accordance with Paragraph 4.1.2 need not increase, and
 - ii) reductions on stairs and ladders (see Paragraph 3.4.4 of Acceptable Solution C/AS5), and
- b) If the distance to the *final exit* exceeds the allowable length for total *open path*, the remainder of the *escape route* shall be a *safe path*. (See Paragraph 3.9.7 of Acceptable Solution C/AS5 for *safe path* length restrictions within a single floor level.)

Amend 3
Jul 2014

Table 3.2 Travel distances on escape routes for risk group VP			
	No system and Type 2 system	Type 3 system	Type 6 system
<i>Dead end open path</i>	35 m	45 m	70 m
<i>Total open path</i>	90 m	110 m	180 m
If smoke and heat detection systems are installed in order to extend permissible travel distance in accordance with this table and are not a requirement of Paragraph 2.2.1 then Fire Service connection is not required.			

Amend 3
Jul 2014

Part 4: Control of internal fire and smoke spread

CONTENTS

4.1 Firecells

4.10 Intermittent activities

4.1. Firecells

4.1.1. Spaces within a *building* to which this Part applies shall be separate *firecells*, with the following requirements:

- a) *Firecells* shall be *fire separated* from other *firecells* by either:
 - i) the *life rating* specified in Paragraph 2.3 of this Acceptable Solution if the *firecell* is categorised in *risk group* VP, or
 - ii) the higher of the two *life ratings* if it is categorised in another *risk group* (see Paragraph 2.3 of the relevant Acceptable Solution to determine that rating).
- b) Within the car park *firecell*, all floors (including *intermediate floors*) and their supporting structures shall be *fire* rated to the *life rating*. The *property rating* shall be used where necessary to achieve protection from spread of *fire* to neighbouring property/titles. See Figure 4.18.
- c) Within the car park *firecell*, where the car park spaces and other areas of that *firecell* are unit titled, it is permitted to have the car park spaces and an associated storage area (limited to plan area of 3.0 m² and maximum height 3.0 m) unseparated from adjacent titles, and
- d) Within the car park *firecell*, other spaces (such as a ticket office, a gate booth or a storeroom not greater than 10 m²) are permitted, when they are necessary for the operation of the car park, and
- e) Service vehicle and unloading areas may be part of other support activity *firecells*.

Amend 3
Jul 2014

Comment:

A car parking *building* may be one *firecell* extending from below the level of the *final exit* to any number of floors above, with each floor (except the lowest) being an *intermediate floor*.

In the absence of *fire separations* on a single floor, the space is treated as a single *firecell* and the *fire safety systems* for the primary *risk group* apply throughout the floor.